

Rocky Mountain National Park

Fuel Layers Development

File Name: *romo_fuels40*

Purpose: This fuels grid was used to create the themes needed for the fire simulation programs FARSITE and FlamMap.

- Projection and Datum: UTM Zone 13, Meters, NAD 1983
- Date Completed: 07/10/06
- Contact: Pat Stephen, Fuels and Fire Behavior Technical Specialist, NPS-IMRO

Development process:

The ROMOVEG coverage ROMOVEGmetadata.html developed by the NPS Inventory and Monitoring Program for Rocky Mountain National Park (RMNP) was used to derive the fuel model as described below and to create the fuels grid, *romo_fuels40*. The fuels grid was then modified (using FARSITE's Landscape Calculator) to reflect changes in the fuels due to mechanical treatments since 2001. It was then exported from FARSITE and converted to raster. The resulting fuels grid covers all of RMNP as well as the surrounding environs.

FUELS:

A Vegetation-to-Fuels crosswalk workshop was conducted on March 2, 2006 with participants from Rocky Mountain National Park fire and resource management staffs as well as numerous other interested individuals: Nathan Williamson (ROMO fire ecologist), Doug Watry (ROMO Fuels Management Specialist), Emily Gubler (ROMO Fuels Technician), Michelle Anderson (ROMO FPMA), Justin Kincaid (Alpine IHC Logistics Foreman), Ron Thomas (ROMO GIS Specialist), David Pillmore (Database Technician, I & M Rocky Mountain Network), Jeff Connor (ROMO Natural Resource Specialist), Kara Paintner (Fire Ecologist & Natural Resource Liason, NIFC), Karl Brown (I & M Vegetation Mapping Program Manager), Mohammed Kalkhan (professor, Colorado State University), Chris Lea (botanist, I & M Vegetation Mapping Program), Paul Mintier (ARNF – Sulphur Ranger District FMO), Dave Farmer (Colorado State Forester), Jesse Duhnkrack (former ROMO Fire Management Officer and current IMRO fire planner). Intermountain Regional fire staff members (Doug Stephen and Pat Stephen) facilitated the discussion.

During the workshop, vegetation types (Common_Map name) were discussed and the group came to a consensus on the assignment of the most appropriate FBPS Scott and Burgan 40 (see [ScottBurgan2005-GTR-153.pdf](#)) fuel models based on vegetation type, canopy cover, side of Continental Divide (east versus west) and location in the park.

The group was unable to finish the fuel assignment crosswalk in one day so it was agreed that the remaining vegetation types should have fuel model values assigned by Pat Stephen using vegetation/fuels plot data and photos as well as her local knowledge of the park. A draft fuels map was created and presented to Rocky Mountain National Park fire staff on June 29, 2006 and the requested

revisions (Elk Winter Range fuels modified as shown in table below) were made using *elkranges05_NAD83.shp*. Fuel model numbers assigned can be found in Table 1.

Table 1. Fuels Model numbers assigned during vegetation-to-fuels crosswalk (sorted largest to smallest acreage)

Vegetation / cover type	Fuel Model 40
SubAlpine Mixed Conifer	161
Montane Douglas Fir	165
Lodgepole Pine - Low Elevation < 9500 ft West side of Continental Divide	161
Lodgepole Pine - Low Elevation < 9500 ft East side of Continental Divide	183
Herbaceous Wetland SubAlpine/Alpine- Meadow	181
Herbaceous Upland Alpine Fellfield	99
Talus and Outwash	99
Cliff Face - Bare Soil / Rock, exposed soil	99
Herbaceous Upland Alpine > 9600 ft	181
Lodgepole Pine - High Elevation > 9500 ft West side of Continental Divide	161
Ponderosa Pine Shrubland	122
Lodgepole Pine - High Elevation > 9500 ft East side of Continental Divide	184
Ponderosa Pine Rockland	183
Herbaceous Upland Montane < 9600 ft	101
Riparian Upper Montane Mixed Conifer > 8500 ft	161
Krummholz	181
Ponderosa Pine Graminoid	101
SubAlpine Limber Pine	181
Ponderosa Pine Graminoid	121
Rock (Alpine-Upper Subalpine)	99
Herbaceous Wetland Cross Zone - Wetland	103
Shrub Upland Alpine	141
Shrub Upland Lower Montane - Big Sagebrush	121
Shrub Riparian Cross Zone > 9600 ft	122
Shrub Riparian Cross Zone < 9600 ft	122
Mixed Conifer with Aspen (Douglas-fir)	161
Unvegetated Surface	99
Upper Montane Aspen	161
Natural Lakes, ponds, streams, rivers	98
Reservoirs - Stock tanks	98
Mixed Conifer with Aspen (Lodgepole Pine)	184
Blue Spruce	161
Mixed Conifer with Aspen (Ponderosa Pine)	121
Herbaceous Wetland Cross Zone - Wetland	102
Mixed Conifer with Aspen (Spruce - Fir)	161
Lodgepole Pine - Rock	181
Riparian Upper Montane Mixed Conifer > 8500 ft	165
Riparian Lower Montane Mixed Conifer < 8500 ft	161
Riparian Aspen	161
Mixed Conifer with Aspen (Ponderosa Pine)	161
Juniper	121
Disturbance - Dead and Down (Ouzel area)	165
Disturbance - Dead and Down	99

Vegetation / cover type	Fuel Model 40
Glacier	92
Disturbance - Dead and Down (Ouzel area)	161
Lodgepole Pine - High Elevation > 9500 ft	187
Mixed Conifer with Aspen (Spruce - Fir)	161
Juniper	161
Ponderosa Pine Rockland	186
Lodgepole Pine - Rock	183
Ribbon forests Islands	181
Herbaceous Wetland Cross Zone - Marsh	98
Cottonwood	161
Juniper	181
Grass and grass-shrub (including open Ponderosa) vegetation within the Elk Winter Range	101 & 121

Additionally, alterations in fuels since autumn of 2001 (as a result of manual fuel treatments) were discussed. Fuel characteristics were then modified to reflect these changes using *RMP_fuels_work_v8.shp* provided by Emily Gubler. See Table 2. Both the modifications made to the Elk Winter Range and updates to fuels to reflect manual treatment areas were completed using FARSITE's landscape calculator.

Table 2. Fuels Characteristic changes following Fuels Treatments

Mechanical Treatment s	Change in surface fuel model
All treatment areas	TU5 changed to TU1 TL4 changed to TU1

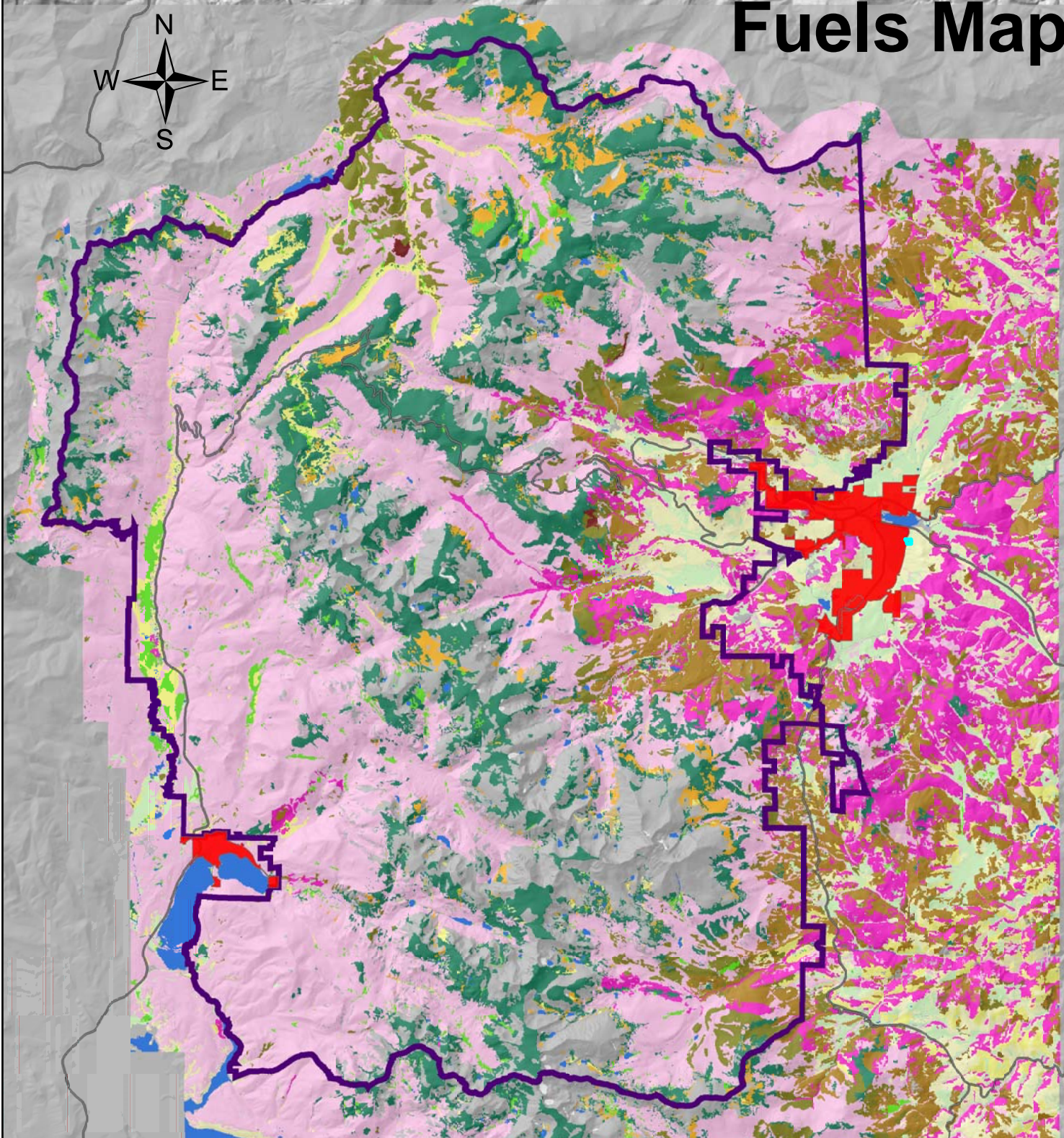
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*****NOTE*****

When doing fire behavior calculations and/or simulations using the new dynamic fuel models (grass, GR 1- 9; grass-shrub, GS 1- 4; shrub SH 1 and 9; timber-understory, TU 1 and 3) it is crucial to use the appropriate live herbaceous fuel moistures. (see [ScottBurgan2005-GTR-153.pdf](#) pages 6-7).

This fuel model layer is meant to represent conditions as of March 2006. Following alterations of fuels from fire, fuel treatments, floods, avalanches, etc. updates to the fuel layers should be considered.

Rocky Mountain National Park Fuels Map



Surface Fuel Models

